

REMARKS/ARGUMENTS

This paper is in response to the Office Action mailed November 21, 2003. By this paper, claims 25-27 are added. Accordingly, Claims 16, 17 and 25-27 are pending upon entry of this amendment.

Response to Rejection of Claim 16 and 17

Claims 16 and 17 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Pavate et al. (U.S. Pat No. 6,001,227). Applicants respectfully request this rejection be withdrawn in view of Applicants' comments below. It has been discovered that the cause of macroparticle generation during sputtering is the presence of relatively large dielectric inclusion having a size greater than about 400-800 μm in the metal sputtering target. The claims are directed to a sputter target comprising, inter alia, a face area of target material to be sputtered onto a desired substrate, said target material being substantially free of inclusions in said target material of the size of 800 μm and greater and wherein said target material includes a sputter track having a sputter track area adapted for increased consumption of said target material thereat during sputtering, said sputter track being substantially free of inclusions therein of the size of 400 μm and greater. Applicants submit that claims 16 and 17 are patentable over the references of record, and particularly over Pavate et al., because the cited art does not show or suggest the desired feature of a sputter target being substantially free of inclusions in said target material of the size of 800 μm and greater and wherein said target material includes a sputter track having a sputter track area adapted for increased consumption of said target material thereat during sputtering, said sputter track being substantially free of inclusions therein of the size of 400 μm and greater.

Pavate et al. disclose a sputter target having dielectric inclusions of metal oxides such as Al_2O_3 , nitride precipitates and carbide precipitates of sizes larger than about 1 micron in concentrations less than 5,000 such inclusions per gram of target material. ('227 patent, col. 12, lines 49-62). Thus, Pavate et al. disclose a range for the number of such dielectric inclusions in an acceptable target. The cited reference does not teach a target material being substantially free of inclusions of the size of 800 μm and greater and

having a sputter track being substantially free of inclusions therein of the size of 400 μm and greater. Applicants believes that the larger than 1 μm size is not substantiated by any known practice and is strictly based on speculated criterion to achieve the desired outcomes.

Additionally, even if the cited reference were to teach a range of the size of the inclusions, the cited reference does not teach Applicants' narrower range with "sufficient specificity" so as to anticipate or make obvious Applicants' claimed invention. In the present application, claim 18 claims a target material being substantially free of inclusions of the size of 800 μm and greater and claim 17 claims a target material having a sputter track being substantially free of inclusions therein of the size of 400 μm and greater. A claimed range is not rendered obvious if the particular claimed range achieves unexpected results relative to the prior art range. See In Re Waymouth, 499 F.2d 1273, 182 USPQ 290 (CCPA 1974). Applicants submit that if the claims are directed to a narrow range, the reference teaches a broad range, and there is unexpected results within the claimed narrow range, the Examiner may conclude that the narrow range is not disclosed with "sufficient specificity" to constitute an anticipation of the claims. (MPEP 2131.03).

Applicants have discovered that at a sputtering power of between about 25-30 W/cm^2 (the sputtering power density normally encountered in the sputtering of flat panel displays), inclusions with size greater than about 400 μm are required to produce arcs of sufficient intensity to generate macroparticles. Inclusions with surface areas below this value can generate arcs, but the intensity of the arcs is not sufficient to melt the aluminum target spot and provide a large enough pressure wave to eject molten metal macroparticle droplets. Above this threshold, inclusions surface area, the arcs have sufficient energy to melt a small spot on the target and eject molten metal droplets from the target. (See Fig. 1; page 3, lines 18-30). Accordingly, claims 16 and 17 is not anticipated by or made obvious by the cited reference and favorable consideration of the claims is respectfully requested.

Applicants would like to distinguish the teachings of the present Application from Pavate et al. The Application states on page 4, lines 6-8 and lines 18-19 that the addition of silicon significantly reduces the dielectric inclusion density in aluminum alloys. However, in col. 9 lines 15-17, Pavate et al. teaches, "Silicon can combine with any of O, N and C to form dielectric inclusions, and as such its content should also be minimized (emphasis added)." Pursuant to M.P.E.P. § 2141.03, "A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention." W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 U.S.P.Q. 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). Therefore, by considering Pavate et al in its entirety, it should not be used to reject the present Application because the disclosure of the additive of silicon in aluminum alloys in the Application is drastically different to the teachings of Pavate et al.

Applicants have added new claims directed to subjected matter that Applicants believe is patentable over the cited art. Prompt allowance of the new claims is respectfully requested.

In view of the Examiner's earlier restriction requirement, Applicants retain the right to present Claims 1-15 and 18-24 in a divisional application.

Conclusion

In view of the remarks made herein, Applicants submit that the claims presented herein are patentably distinguishable from the art applied and prompt allowance of the application is respectfully requested.

Appl. No. 10/018,406

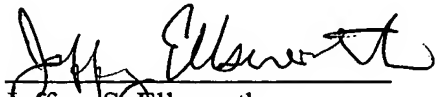
Amdt. dated June 4, 2004

Reply to Office Communication dated June 1, 2004

Should the Examiner determine that anything else is desirable to place this application in even better form for allowance, the Examiner is respectfully requested to contact the undersigned by telephone.

Respectfully Submitted,

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Date: June 4, 2004